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(71)Applicant : KOMATSU LTD

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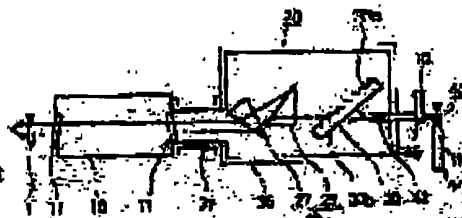
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## (54) NARROW-BAND OSCILLATION EXCIMER LASER EQUIPMENT AND ITS PURGING METHOD

## (57)Abstract

**PURPOSE:** To eliminate the fluctuation of oscillation wavelength of output laser light due to the change of refractive index of gas on the grating surface, and restrain heat generation of optical elements, by arranging an introducing port of clean gas for purging on the rear side of the grating, and preventing the clean gas from flowing on the trench surface of the grating.

**CONSTITUTION:** The title equipment is constituted of a front mirror 1, a laser chamber 10 for oscillating laser, and a narrow bandwidth equipment for narrowing the laser bandwidth, which equipment is constituted of a prism beam expander 25, a grating 30, a cabiner 35 and a clean gas equipment 40 which blows out clean gas from a clean gas introducing port 42 via a flowmeter 46 from a clean gas cylinder 44. The clean gas introducing port 42 is arranged on the rear side 30b of the grating 30. The gas flow is not generated on the trench surface 30a of the grating 30, so that the fluctuations of the center wavelength of output light and a beam profile do not occur. The inside of a narrow bandwidth box 35 and the inside of a pipe 37 are filled with the clean gas.



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## (54) NARROW BAND LASER DEVICE

## (57)Abstract:

PURPOSE: To reduce fluctuation of beam profile and to acquire laser light of stable output by providing an air flow generating means which makes gas flow to a reflection surface of a diffraction grating.

CONSTITUTION: Air flow is made to occur in a reflection surface of a diffraction grating 30 by blowing gas against the diffraction grating 30 by a fan 40. Thereby, a surface of the diffraction grating 30 is cooled and gas in an area near a surface of the diffraction grating 30 is forcibly moved to prevent gas in an area near a surface of the diffraction grating 30 from being heated by the diffraction grating 30. Since air flow is generated forcibly in a surface of the diffraction grating 30, gas is not heated by heat of the diffraction grating 30 and does not generate natural convection. Thereby, it is possible to prevent beam profile from fluctuating.



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